

TOWARDS A SUSTAINABLE TOURISM DEFINITION FROM SYSTEMS SCIENCE PERSPECTIVE

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ABSTRACT

The tourism system has as main components, social, economic and natural subsystems, which are linked together to give rise to tourism activities in particular contexts called destinations. Tourism to be regulated under a legal framework on protected areas, to offer interpretations regarding commercial activity and the natural protection, which at first seem contrary relations, arising from excessive use of natural and cultural resources to generate tourism services. However, under the perspective of these antagonistic, Systems Science can be considered as complementary. The purpose of this paper is to study the complexity of sustainability case study taking as a destination in the Mexican Caribbean, to highlight, through the Viable Systems Model, complementary relationships between economic development and natural care which converge in production of tourism services. This implies a holistic view that encompasses the subsystems (social, economic and natural) and the system above (sustainable tourism) described in the elements and relationships that make up the 5 sets of viable model.

Keywords: Sustainable Tourism System, Complementarity, Viable System Model.

I INTRODUCTION

Tourism has characterized as an activity that promotes regional development as it contributes to social and economic welfare by enabling the development of communities. Meanwhile sustainability has generated tourist layout changes since their concept involves the development of activities suitable for environments of protection (cultural, social and ecological environment), these dimensions make sustainable tourism development a complex construct, because each element relates recursively with the other elements. Some authors approach the subject, from the perspective of a particular science Woodcraft (2012) in social sustainability, Awudu & Zhang (2001) with administrative issues and Stojanovic, & Farmer (2013) with natural resources. In these studies, the analysis is defined by the specialty of the investigator. However, the definition tourism is not as simple as it is considered a social, environmental and cultural implications for developing an economic activity.

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According to Hunter, (1997), sustainable tourism should not be considered as a rigid framework, but rather as an adaptive paradigm which legitimizes a variety of approaches according to specific circumstances. This interpretation has resulted in sustainability antagonism between environmental care and economic activities. Mass tourism and sustainable tourism are seen as polar opposites (Pearce, 1992), in which the negative environmental and social impacts are attributed solely to mass tourism, (Clarke, 1997), derived from the reproduction of capital by through tourism. According to Palafox (2011), this problem has caused the separation of the study of tourism (Lanfant and Graburn, 1992), based on one aspect of sustainability. Some authors prefer to avoid mass tourism label (Godfrey, 1998), to avoid the contradiction as this type of tourism have generated as collateral problems, economic and social inequality, discrimination, environmental problems, loss of natural protected areas among others.

The relationship between the environment and tourism comes from the fact that the former provides the latter, leading to asymmetrical relationships (Romero, and Arriaga 2007). In the view of Weaver (2000), Sustainable Mass Tourism (SMT) is defined as a high-intensity activity that is kept within the limits of carrying capacity, controlled by environmental legislation, which has shown nature destinations synergy to preserve resources. Which makes sense, since it must ensure the quality of the environment at a rate that tourism depends on the beauty of ecosystems (Macias and Aristides 2009), especially in the Protected Natural Areas (PNA), where planners are more motivated to take care of natural and cultural resources (Crosby & Moreda, 1999; Crespi & Planells 2006). This synergy has transformed conventional tourism enterprises and destinations, which will continue to move in the direction of sustainability (Weaver, 2012). However, these changes can come from management council politics and sustainable market considerations rather than planning or scheduling activities which undermines the sustainability of tourism. Therefore, it is necessary to define structural schemes to help overcome the particular analysis of tourism and its antagonism and allow to have an approach to the definition of sustainable tourism. Systems Science presents a viable alternative to this development as it overcome reductionism by focusing on allowing knowing all internal and external relations of tourism sustainability.

The present systemic study address the sustainability of tourism and consists of the following sections. Paragraph II presents the sustainability and the importance of government regulation on tourism. Paragraph III deploys systemic considerations of sustainable tourism. Paragraph IV illustrates the theory and application of the Beer's viable systems to a case study in the Mexican Caribbean, arriving at some preliminary conclusions.

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II. GOVERNMENT REGULATION AND SUSTAINABILITY IN TOURISM

The issue of sustainability in tourism has been treated by various forums and conferences; among the most important are: The Manila Declaration on World Tourism in 1980, the Charter of Tourism and Tourist Code in 1985, the Hague Declaration on Tourism in 1989, the Rio de Janeiro Summit in 1992, The Conference on Sustainable Tourism in Lanzarote in 1998, The Code of Ethics for Tourism in 1999, the Quebec Declaration on Ecotourism in 2002 Djerba Declaration on Tourism and Climate Change in 2003, among other contributions, which have advanced conceptual understanding of the subject.

The principle of sustainability and refer to established tourism dimensional balance to ensure long-term sustainability (WTO, 2004), ie, generating a form of tourism that contributes to quality of life and services, as well as, economic and social welfare for the local community (Aronsson, 1994). Sustainable tourism destinations essence provides the opportunity to earn foreign exchange while maintaining long-term economic and environmental viability of the area (Sandoval, 2006), contributes to the formation of mutually beneficial relationships to improve the quality to preserve life and environments. Therefore, establishing adequate service production with special care in the areas under attractive cultural elements rescue and protection of biodiversity, structure facing the dilemma of primarily economic activities.

Meanwhile, the political management as a means to develop sustainable tourism began to be seen in the 80s, taking greater force in the 90s, in principle by integrating dispute socio-economic and socio-cultural within of sustainable development committee (UN, 1999), which was the need to develop policies, strategies and plans for organizations, companies and communities. For its part, the Code of Ethics for Tourism introduced regulations for professional practice (UNAM, 2000), and invited Governments to you review your plans and strategists on natural biodiversity in the Convention on Biological Diversity and Tourism Development (CBD, 2004), with the intention of identifying visions and objectives by reviewing legislation, planning and destination management. For its part, the declaration of ecotourism held in Quebec, instruments and recommendations raised in this organisation (UNEP, 2003), and highlighted the emphasis on international cooperation and improving market access to enable sustainability in sustainable development summit (JDSO, 2002).

The integration of sustainability in tourism to the state planning in Latin America, is located in the model of social and economic dependence derived from the center-periphery. This approach discussed tourism as a means to overcome the economic and cultural gap extolling the development and progression pathway for constituent terms, according to Gómez (2005), the design of appropriate policies to refloat follows structural contradictions

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as exclusion and segregation of communities and the emergence of collective conflict implicit in the direction of development. Sustainable tourism is relevant to include activities in natural environments because it is a social activity that has a compelling stake in the economy, Molina & Rodriguez (2009) state that tourism contributes to the transformation of the cultural milieu manifested by economic (higher incomes) social (increased free time) or political (more freedom of expression) to a given context.

The incorporation of sustainable tourism should be a proposal to increase the ability to generate wealth, focusing on cultural and natural relationship. The phenomenon of tourism emerges from the relationship of inputs to integrate an activity on the basis of relevance and may build development of alternative tourism activities (Stephen & Neil, 1999; Baoren, 2011, Reimer & Walter, 2013, Morales, 2008). Because the interests of demand appear to be appropriate with the considerations of this model. In this approach, tourism creates jobs and protects natural and cultural resources, improving the quality of life of communities (Meyer, 2002), ie an activity brings renewal and social environment, fostered by consumers that can participate in the preservation, development and improvement of tourism environments, originated precisely in the fact that the use of leisure time is a psychological activity (Sue, 1982), since it depends on what each individual proposed nourished with current trends of resource conservation and social responsibility, claim that some of that tourism is a reactive force to market considerations. Therefore, the production of services in mass tourism with sustainable vision appeals to rethink how to plan and operate tourism services.

In the present reality, the communities do not have the means and measures to advance the election of their livelihoods and maintain a transcendence toward self-management in terms of being able to reach new positions of relevance in relation to a planned development level. Therefore, it is necessary to highlight the dysfunctional in mass tourism destinations of nature to propose new mechanisms that help develop sustainable activities with relevance.

III. SUSTAINABLE TOURISM SYSTEMIC CONSIDERATIONS.

The General Systems Theory (GST) is appropriate to address general issues relating to interdisciplinary tourism (Leiper in Farrel & Twining, 2004), their approaches in this field are aimed at developing more refined definitions (Jafari, 2005). The GST has a widespread, scope and is used in studies of the area. Today is the theory that best explains the dynamics of tourism (Panosso, 2007), in contrast to the inability of reductionist science to deal with the volatile tourism system.

Sustainable tourism in the dynamic interactions of each system exert direct or indirect influence on other systems (economic, social, environmental). Tourism can be considered as an adaptive system. According to Ackoff (1999), adaptive systems are able of change of an internal state to another in response to environmental variation. In this relationship, the

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sustainable purpose is interpreted as knowledge based on experience, to Checkland (2001), it can turn to a new knowledge after a new experience that can bring communities to develop a more sustainable tourism.

Directed systems (ie sustainable tourism) operated with feedback controls (Beer, 1985). The cybernetic operations (control) introduces a degree of order that eliminates the uncertainty. The information kills the variety and range reduction is one of the main techniques of regulation (Beer, 1980) since the entropic advance in social systems, is its static state or dysfunctional because the active homeostatic process from the reaction inside the balance with their environment.

According Ashby (1965), to operate the law of requisite variety, it should be identify the essential variable. In the case of sustainable tourism can point out the economic social and environmental systems that display teleological balance, which describes the purpose of the sustainable system with extremely complex environment which is affected by tourism activities and other natural and social phenomena.

On the other hand, the legal context is the psychological control statement by Mirror & Harnden, (1989), as one who keeps order not to alter the system completely. In nature tourism environments such as ANP, the legal framework governing the qualification specifications, intensity and form of tourist destinations which in turn results in facilities, services and activities.

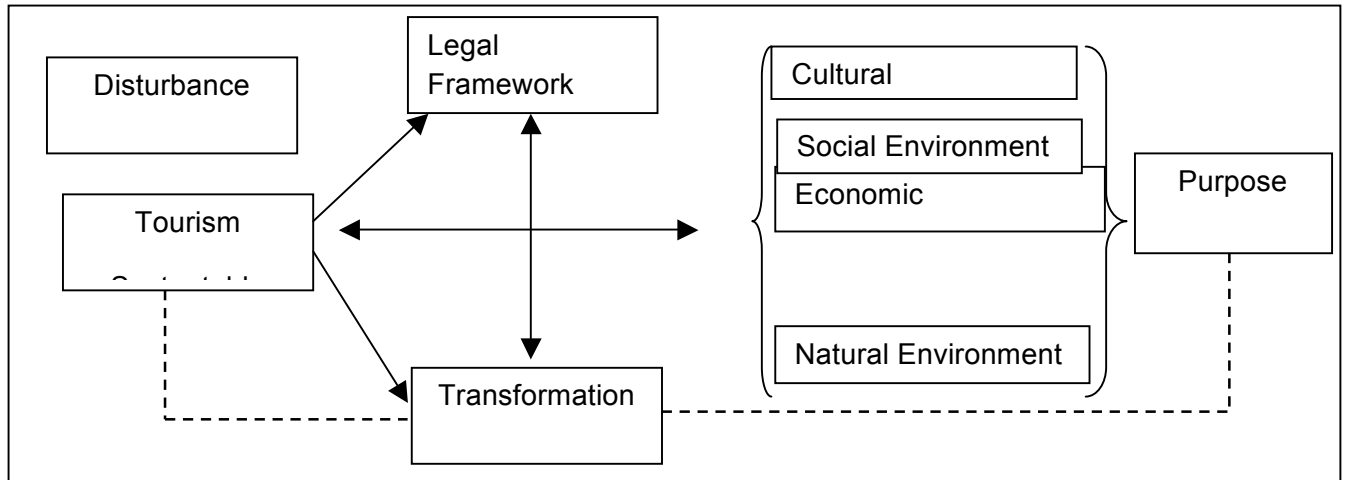


Figure 1. Diagram of sustainable system variety.
Source: Adapted from Espejo & Harnden (1989)

IV. VIABLE SYSTEMS MODEL APPLIED TO THE CASE STUDY: A TOURIST DESTINATION IN THE MEXICAN CARIBBEAN.

Cozumel is the largest island in the Mexican territory, is located in the southeast of the Republic in the Caribbean Sea, is known as the island of the swallows and is part of the

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Riviera Maya. It has natural attractions such as the Lagoon and Punta Chancanaab south, cultural and archaeological sites of San Gervasio and Cedral of Mayan origin, in addition to a regional museum. In their folklore events is Carnival and Fair of the Holy Cross and their crafts working marine materials such as snails, shells and black coral.

Chankanaab is a refuge for the protection of marine life of the west coast of the island of Cozumel. It is located in the protected area (PA), Cozumel reefs decreed on July 19, 1996 (CONANP, 2012a). The attractions with a lagoon that count, the botanical garden, the house maya, and rest facilities spread across the beach and pool area, with restaurants, souvenir shops, spa, and dolphinarium. The park is located at kilometer 9.6 of the coastal road south, 15 minutes from the town of San Miguel de Cozumel.

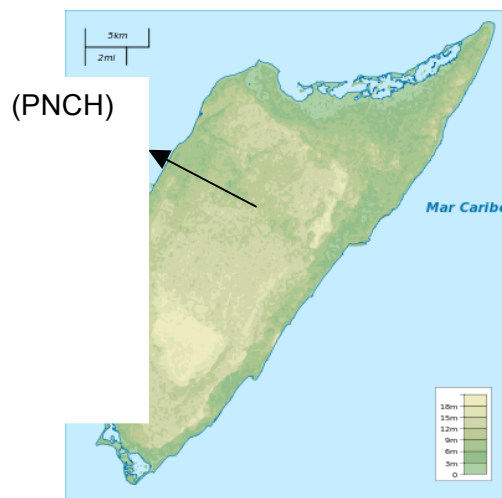


Figure. 2 Location Chankanaab National Park in the Cozumel Island
Source: Wikimedia maps (2011)

Tourism activities that take place in this attractive marine area mainly which include water sports, diving and snorkeling with flora and fauna.

For this study the approach to sustainable tourism is considered as a system matching this definition with the analysis developed in Part I, II and III (see Figure 3).

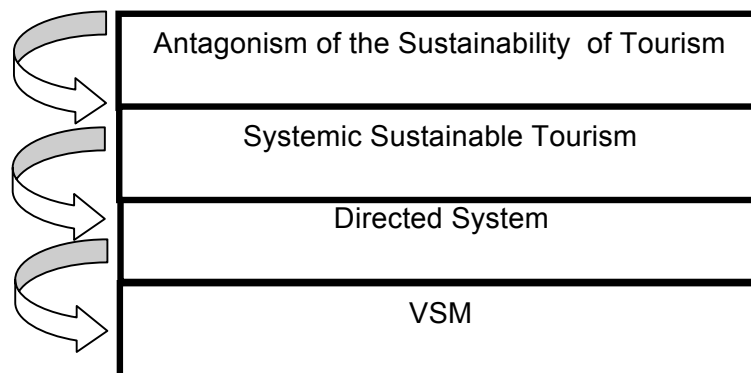


Figure 3. Case study design

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System 1

The system 1 is constituted according to Beer (1985) in their own right viable systems which generate autopoietic constitution, it consists of elements that produce the system.

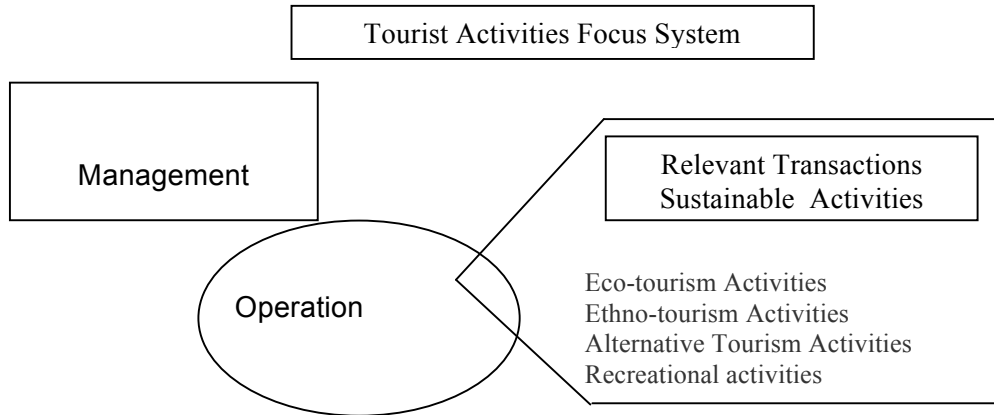


Figure 4. The system 1.

Source: Adapted from Beer (1985)

The system 1. Generate sustainable activities with development potential in Chankanaab Park, must from tourism ethics, to enact genuine productive activities departing from the context of legal protection in accordance with the principles of sustainable tourism (see Figure 5).

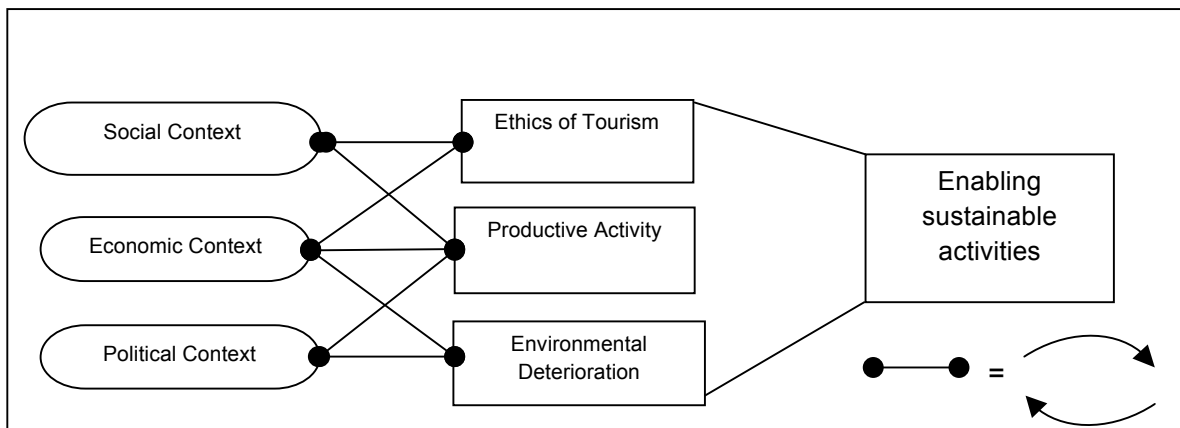


Figure 5. Relationships of System 1.

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Sustainable purposeful activities not mean sacrificing comfort in the services, but adapt to integrate cultural elements of mutual enrichment, this attraction is suitable for developing eco-tourism activities, ethno and alternative tourism among which may be mentioned, craft workshops, species recognition of marine photography, hiking, dining representations among others. To stimulate the development of local traditions through respect and conservation. The design of the system 1, begins by recognizing the pattern of presentation of the application and its availability for activities at the end. Tourists generate the main force of attraction for the activity with specific qualities, (ie define the layout of activities, services and facilities to one or more market niches environmental and cultural tourism).

System 2

System 2 is constituted by the regulating means of the system 1 (coordination), and is composed of the anti-oscillators that maintain the functionality of the system 1 as necessary to coordinate the activities sustainable. The coordination and balance solution should be designed taking into account the activities and their connection to the supra-systems 2-5, which comprehensively have mechanisms of action that allow feasibility of the system 1, so causing the lower costs and damage to people for this case identifies the following elements of coordination (see table 2).

For this case include:

Table 1 Basic Activities of System 2

Development of facilities and infrastructure to enable sustainable activities
Scheduling activities
Economic Breakdown
Service operating mechanisms
Continuous Improvement

System 3

System 3, Constituted by the system control means 1, and whose function is established to ensure harmony and proper functioning to the system 2 provides information on incorporating sustainable state indicators.

The ecological footprint (EF) is widely adopted as a key environmental indicator of sustainable tourism (ST) (Hunter & Shaw, 2007). This dimension refers to the ability of institutions to transform policy needs through coordinated and effective methods to implement the sustainable development of tourism in a given community. (Lozano, et al 2012). The indicators should be based on the needs of local (Perez, et al 2013, Lee, 2013; Castellani & Hall, 2009; Yong, Lee & Shafer, 2002). Bearing in mind the flow of tourists that can support continuous-regional socio-economic system, without changing the economic, social, the cultural and environmental level (Echamendi, 2001). For this case include the social, economic and cultural (see Table 1).

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Table 2. Basic activities of System 3 *

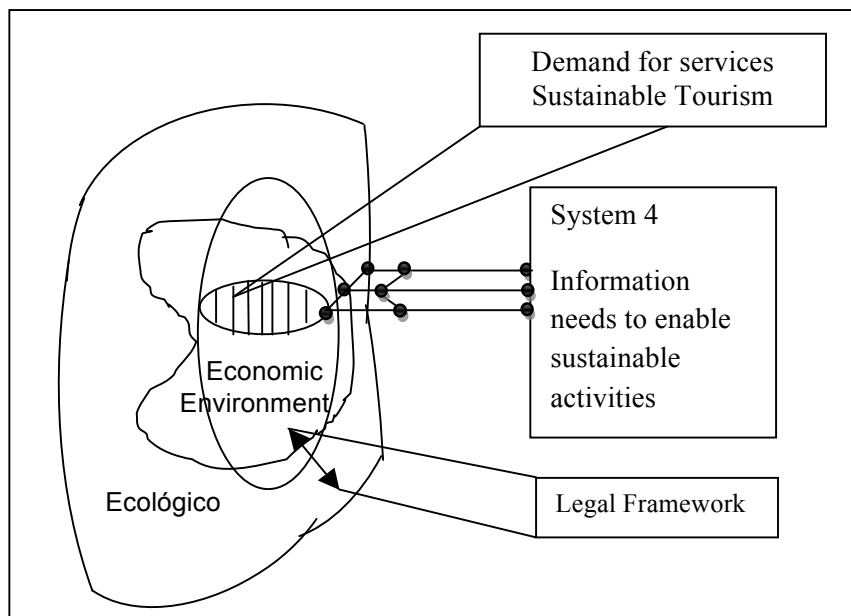
1. - Environmental legislation through the regulatory framework of natural resource protection regulations and laws made by official Mexican standards (SEMARNAT, 2012) and the regulations of protected natural areas CONANP (2012b).
2. - Ethics of tourist services, composed of the concepts of Culture Tourism SECTUR (2013).
3. - Strategies National Development Plan that includes: increase tourism's contribution to poverty reduction and social inclusion. Position Mexico as an attractive destination in underdeveloped segments such as cultural tourism, ecotourism, adventure and health drive sustainability and tourism revenues are generated source of social welfare (PND, 2013).

System 4

The system 4 is intended for the organization gather all possible information of the total environment to remain a viable medium to long term. Integrates resource conservation needs, environmental and social costs of the system and relations with other stakeholders especially the government. These functions must detect relevant information and permearla to focus system, to adapt the system 1 and the recomposition of 2-5 systems through evolution.

In this System 4, is useful to identify the development of products and markets that will be targeted on the basis that the development of tourism products is a process that modulates the destination property to meet the needs of consumers UNWT (2011).

Thus, market segmentation must be sustainable,(ie, with enough potential to be considered a continuous source of tourists). WTO (2007), leading to sensitize the political will and resources to determine the type of management leadership WTO (1998) and coordination necessary to create economic benefits as the multiplier effect, without losing sight of the main benefits are created within communities (Cohen, 1974).



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Figure 6 Environments of Systems 4

System 5

The system 5, is formed by the Board of stakeholders in this case consists of an association of parks and museums of the municipality, which is responsible for the management of the tourist attractions in Cozumel. The System 5 is responsible for the highest decisions through the definition of the purpose of the organisation is therefore to enable the provision of systems 1 and 4. The scope of sustainable purpose and system control means coordinating and controlling the subsystems 2 and 3 are designed with this relevance. The integration of systems 1-5 are shown in the following figure:

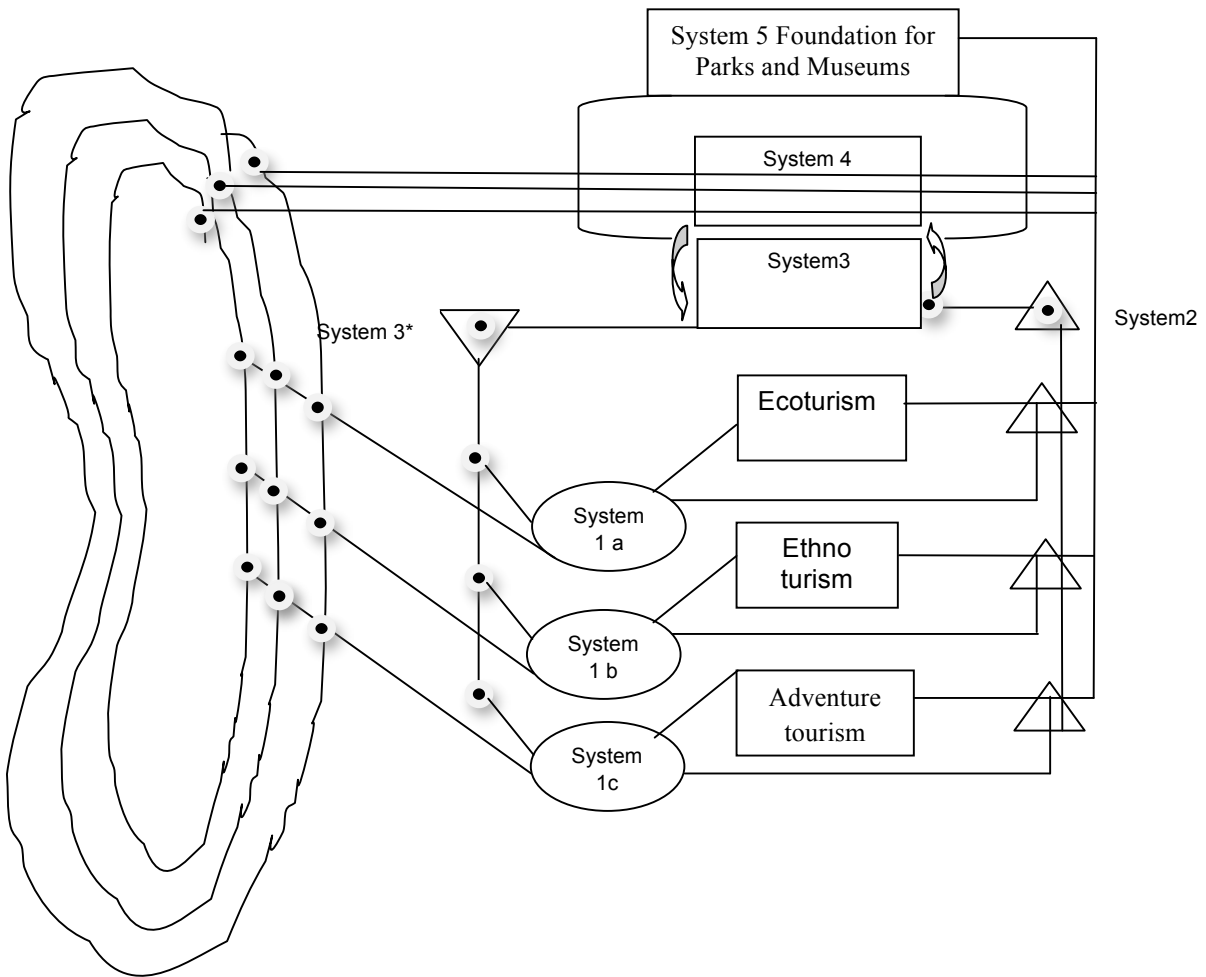


Figure 6. System 5, sustainable system and subsystems 1-4
Source: Adapted from Beer (1985).

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CONCLUSIONS

The Viable System composition distinguishes five integrated subsystems Turistic environments of sustainable tourism. The generation business in the tourism part of Forecasters (key variable) to generate conditions favoring sustainable tourism activities in the care of cultural and environmental resources. To this end it is necessary to identify potential system activities 1, fit the coordination mechanisms set 2 and set individual system control means 3 *. 2 and 3 systems are conceived as a mechanism for improving media recurrence. In system 4 detection highlights the needs of demand and awareness of political will, which must be established recognizing the needs of system 1 and system requirements 3 *. 5 This allows the system to reconfigure the system internal mechanisms.

This work is an effort to cope with the complexity of sustainable activities involving tourism in natural areas. In which you get to the following reflections.

1. - The Systems Sciences provides sustainability relevance to address natural tourist destinations.
2. - Economic activity and social care and ecological environment are complementary relationships intertwine to develop sustainable tourism activities. To the extent that these activities can flourish in protected environments ANP, it will have more experience and knowledge to improve destinations in Mexico.
3. - The legal regulation restricts increase in ANP facilities, provides an opportunity to enable new ways in destinations intensive sightseeing.

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